December 7, 2017

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Via Electronic Filing

Re: *Restoring Internet Freedom,* WC Docket No. 17-108

Dear Ms. Dortch:

New America's Open Technology Institute ("OTI") has previously filed comments addressing the proper classification of broadband internet access service (BIAS) and the impacts of the Domain Name System (DNS) and caching on that classification.[1] In particular, OTI has argued that BIAS is a telecommunications service and that domain-to-IP address translation DNS (called "DNS" in this ex parte) and caching are services, when provided by ISPs, that fit in the management exception of the definition of information services.

Nevertheless, the Federal Communications Commission (FCC) insists (in the draft of the Order) that DNS and caching are not for the management of a telecommunications service, and therefore, the FCC surmises, the services provide sufficient reason to classify BIAS providers (or "internet service providers" or "ISPs") as information services. These claims are based on misconceptions of arguments in the docket and the Order relies on some of these misconceptions. This filing aims to correct some of those misconceptions.

It Is Wrong to Argue that Without ISP-Provided DNS, DNS would not exist.

The Order spends substantial time discussing DNS. But that section incorrectly assumes that without ISP-provided DNS, consumers would have no DNS at all. Specifically, the FCC argues that "[w]hile ISPs are not the sole providers of DNS services, the vast majority of ordinary consumers rely upon the DNS functionality provided by their ISP, and the absence of ISP-provided DNS would fundamentally change the online experience for the consumer."[2] This argument is categorically false.

[1] *Generally* OTI Comments at 30-34; OTI Reply Comments at 19.
[2] Draft Order, ¶ 33.

Almost nothing would change should ISPs decide to stop providing DNS tomorrow. Online content providers have an extremely obvious incentive to ensure that consumers can continue finding those companies by typing "www.[companyname].com" into a browser, rather than an IP address. While ISPs can and do provide this service, third parties *also* can (and do) provide this service. In fact, as the Order points out but then largely ignores, there are several third party DNS providers, including Dyn, Google, and OpenDNS.

The only thing stopping "the majority of ordinary consumers" from adopting a different DNS provider is the fact that changing your DNS provider, while extraordinarily easy, is hidden from plain view. If ISPs stopped providing DNS, third parties would likely make changing DNS providers trivial. An operating system or a browser could make it a choice on first boot-up. A router manufacturer could ask users to choose from a list of known DNS providers when they setup their router. Or online companies could facilitate that change. At any rate, third parties would continue providing these services should ISPs decide to stop. Thus, the order sets up a false comparison by assuming that unless consumers have ISP-provided DNS, their online experience would change dramatically.

Third, it appears as though third party DNS providers are gaining in popularity. In the Order, the FCC states that "[w]hile ISPs are not the sole providers of DNS services, the vast majority of ordinary consumers rely upon the DNS functionality provided by their ISP…"[3] However, the article cited and relied on by Sandvine ("*DNS Resolvers* study"), argues that "it is now common to see customers using a public DNS service instead" of an ISP's service.[4] In addition, there is at least some evidence that third party DNS providers are more secure than ISP-provided DNS.[5]

Users Observe Essentially No Impact on Performance Between ISP-provided and Third Party-provided DNS

The FCC relies on Sandvine's statement that ISP-provided DNS is "superior" to third party services.[6] However, the *DNS Resolvers* study, relied on by Sandvine, does not support this claim. User experience will primarily be dictated by the throughput of the application, and the study showed that throughput differences between the European ISP-provided DNS and the Google DNS are minimal. The European ISP-provided DNS allowed 3.2 mbps throughput, while Google DNS allowed 3 mbps throughput. This similarity led the authors of the study to state "both DNS services result in a similar throughput despite a different [round-trip-time]."[7] Even if we assumed that round-trip-time were the primary dictator of user experience, the differences

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[3] Draft Order, ¶ 33.
[4] Hadrien Hours *et al*., *A Study of the Impact of DNS Resolvers on Performance Using a Causal Approach*, https://www.tlc-networks.polito.it/oldsite/mellia/papers/ITC15DNS.pdf at 1 ("DNS Resolvers Study").
[5] Dan Price, *4 Reasons Why Using Third-Party DNS Is More Secure*, MakeUseOf (Apr. 17, 2017), http://www.makeuseof.com/tag/reasons-third-party-dns-servers-secure.
[6] Draft Order, ¶ 33 n.110.
[7] DNS Resolvers Study at 5.

there are minimal as well. The European ISP-provided DNS averaged 20ms round-trip-time and the Google DNS averaged 48ms round-trip-time. That negligible difference in round-trip-time is likely imperceptible to the user.

The *DNS Resolvers* study also compared the speeds and throughput of one *European* ISP and Google DNS *in Europe*, making its conclusions questionably applicable here. Other studies that measured latency of third party DNS providers found that Google's average latency (worldwide) was 32.94ms (much faster than the 48ms in the study), and OpenDNS had average latency of 45ms and Dyn measured at 50ms.[8] These lower round-trip-times may indicate a more even and comparable experience between ISP DNS and third party DNS than the *DNS Resolvers* study shows.

DNS and Caching Are Incidental to the Transmission Component of BIAS and Do Not Transform BIAS into an Information Service.

The incidental nature of DNS and caching as compared to the transmission component has two implications. First, ISP-provided DNS and caching qualify under the systems management exception in the "information service" definition because they are incidental to BIAS and do not alter the fundamental character of the telecommunications service.[9] As the *2015 Order* explained, "[a]lthough the Commission assumed in the Cable Modem Declaratory Ruling—*sub silentio*—that DNS fell outside the telecommunications systems management exception, Justice Scalia's assessment finds support both in the language of section 3(24), and in the Commission's consistently held view that 'adjunct-to-basic' functions fall within the telecommunications systems management exception to the 'information service' definition."[10] Similarly, caching merely facilitates transfer of information, making it incidental to transmission.[11]

Second, the incidental nature of DNS and caching is relevant to the consumer's perception as to whether BIAS is an offering of telecommunications or rather an information

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[8] Archana Kesavan, *Comparing the performance of popular public DNS providers*, Network World (May 10, 2017), https://www.networkworld.com/article/3194890/internet/comparing-the-performance-of-popular-public-dns-providers.html.

[9] *See* 47 U.S.C. § 153(24) ("[t]he term 'information service' means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, . . . but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service."). *Protecting and Promoting the Open Internet*, *Report and Order on Remand, Declaratory Ruling, and Order*, 30 FCC Rcd. 5601, 5766-67 ¶ 367 (2015) ("*2015 Open Internet Order*") (stated that uses that fit within the management exception "(1) must be 'incidental' to an underlying telecommunications service—i.e., 'basic' in purpose and use in the sense that they facilitate use of the network; and (2) must 'not alter the fundamental character of [the telecommunications service].'") (citations omitted).

[10] *2015 Open Internet Order*, 30 FCC Rcd. at 5766-67 ¶ 367.

[11] *Id*. ¶ 372.

service.[12] If the information service component is *incidental* and the transmission component is *fundamental*, then it is hard or impossible to conclude that consumers perceive BIAS as an information service. Indeed, the ISPs apparently think so too. Their marketing and promotional material is barren of any mentions of DNS or caching.[13]

Conclusion

ISPs provide DNS and caching to facilitate transmission of information over the network. These services are used to manage ISP networks and thus BIAS is not an information service.

Respectfully submitted,

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[12] *See NCTA v. Brand X*, 545 U.S. 967, 989-90 (2005) (holding that the term "offer" as used in the definition of telecommunications service is ambiguous, and finding that the Commission properly took into consideration the term's "common usage . . . [including] what the customer perceives to be the integrated finished product, even to the exclusion of discrete components that compose the product" in classifying the service as a telecommunications or information service); *see also USTA v. FCC*, 825 F.3d 674, 708 (D.C. Cir. 2016) ("when interpreting [the telecommunications service] provision in *Brand X*, the Supreme Court held that classification of broadband turns on consumer perception.") (citation omitted).

[13] *See, e.g.*, *2015 Open Internet Order*, 30 FCC Rcd. at 5757 ¶ 354 ("[t]he record suggests that fixed broadband Internet access service providers market distinct service offerings primarily on the basis of the transmission speeds associated with each offering. Similarly, mobile providers market their service offerings primarily on the basis of the speed, reliability, and coverage of their network. Marketing broadband services in this way leaves a reasonable consumer with the impression that a certain level of transmission capability—measured in terms of 'speed' or 'reliability'—is being offered in exchange for the subscription fee, even if complementary services are also included as part of the offer.") (citations and some internal quotation marks omitted); *USTA*, 825 F.3d at 699, 709 ("broadband providers focus their advertising on the speed of transmission. . . . [I]n the present order the Commission cited ample record evidence supporting its current view that consumers perceive a standalone offering of transmission.") (citation omitted).